

TEKTRONIX

Calculator Software

High-powered programs
for Tektronix' 21, 31, E31,
and calculator systems.



Support and applications software: the shortest distance to solutions.

Natural math hierarchy. User define-able overlays. Conversational ability.

TEKTRONIX SOFTWARE: NATURAL EXTENSIONS OF THE COMPUTATIONAL TOOL. Our software is written from the inside out . . . compiled with a designer's knowledge of the capabilities and logic of our calculators. Simplicity is fundamental to all program development. We try to make data entry and solutions as easy as pressing a key.

Tektronix software is available for support of all 31, E31, 21 calculators and systems. For a number of applications, including statistics, mathematics and electrical engineering. And for specialized customer applications and machine demonstrations.

Applications Software

Tektronix' Statistics, Mathematics and Electrical Engineering application libraries offer the expertise to streamline virtually all your calculation and plotting needs. And each volume is individualized to our 21, 31 or E31.

Tektronix' 21 Statistics Library.
For 128-step memory:

GENERAL STATISTICS AND CURVE FITTING.

Includes programs for random number generation and description statistics for one and two variables.

TESTS AND DISTRIBUTIONS.

Includes tests for significance, goodness of fit, and binomial or Poisson distribution.

Tektronix' 21 Statistics Library.

For 256-step memory option:

GENERAL STATISTICS. Includes descriptive programs for up to three variables.

TESTS. For significance or closeness of fit tests requiring greater elbow-room—such as equality of population variances, t and F tests, and others.

DISTRIBUTIONS. Includes binomial, Poisson, t, F, and more.

CURVE FITTING. Provides concise programming for determining normative curve distribution.

ANALYSIS OF VARIANCE. Includes one-way analysis and Yates 2² and 2³ factorial design.

Tektronix' 31 and E31 Statistics Library, Vol. 1

Designed in large part for the 512-step basic memory, the volume includes general statistics, tests, distributions, and curve fitting programs as enabled by the 31's enhanced memory configuration. Also contains curve fitting pro-

grams for expanded 1024-step calculator.

Tektronix' 31 and E31 Statistics Library, Vol. 2

Coupled with an Option 4 equipped calculator, this volume offers additional programs for one, two and three-way analyses of variance; randomized complete block/Latin square; t-tests; Bartlett's test; F-distribution; and t-distribution.

Tektronix' 31 and E31 Statistics Library, Vol. 3

Programs in this volume require a minimum Option 4 memory configuration (2048 steps). They include multiple linear regression, and polynomial and linearized regressions. With the 31, all data and regression equations may be plotted on the 4661 Digital Plotter. Three data correction options are provided.

Tektronix' 21 Mathematics Library

Although written for the 256-step memory, many programs can function within the smaller basic memory, or by linking one program to another.

GEOMETRY AND TRIGONOMETRY. Includes plane triangle and plane closed polygon solutions.

GENERAL FUNCTIONS. Provides for the evaluation of gamma functions and factorials and number base conversion.



POLYNOMINALS. For solving quadratic and cubic equations, real roots of functions, and 3rd order interpolation.

Tektronix' 31 and E31 Mathematics Library, Vol. 1.

Designed primarily for the basic 512-step, 64-register memory, Vol. 1 contains all the 21 programs plus more complex calculations involving matrix arithmetic, complex operators, vector magnitudes, and so on.

Tektronix' 31 and E31 Electrical Engineering Library, Vol. 1.

This volume contains two major programs:

FFT AND ASSOCIATED OPERATIONS. Handles real time, complex time, and complex frequency waveforms; calculates waveform limits; performs discrete Fourier Transforms or its inverse; calculates convolution/deconvolution and cross-correlation; plots waveforms on optional graphic terminal or plotter (for the 31); and allows user to write his own analysis program using subroutines provided.

FOURIER SERIES. Calculates and evaluates Fourier series in terms of

sine and cosine coefficients or in terms of complex coefficients. With the 31 it allows digital plotting or graphic display.

Tektronix' 31 and E31 Electrical Engineering Library, Vol. 2.

MICROWAVE CIRCUIT ANALYSIS.

An extensive package for circuit analysis that includes parameter conversions; cascade, series, and parallel interconnections; finding lumped matched networks. Parameter printout includes K , U , G_{max} and other gains, f_{max} and f_T , VSWR's, return losses, and gammas for optimum matching.

Tektronix' 31 Electrical Engineering Library, Vol. 3.

PLOTTING AND MAPPING. Facilitates graphics representation—on the 4661 Digital Plotter or 4010 Graphic Terminal—of various parameters associated with microwave circuit design using Polar and Smith Chart formats.

4661 Alpha Character Generator Software ROM.

This is a routine stored in a plug-in ROM, for drawing letters, numbers and symbols on the plotter. Characters may be executed from the keyboard or under program control.

Simultaneous equations and matrices.

For solving two and three simultaneous equations; 3rd-order determinants; 3rd-order matrix inversion and eigenvalue solutions.

VECTORS. Includes vector addition and subtraction, vector cross products, coordinate transforms, vector scalar product and angle, among others.

COMPLEX OPERATORS. Expert programming for a variety of complex operators, from $+$, $-$, \times , \div , to $\arctanh Z$.

INTEGRATION AND DIFFERENTIAL EQUATIONS. Includes Nth-order differential equations and two simultaneous differential equations.

Systems Software

31/53 Instrumentation System.

DATA REDUCTION PROGRAM.

Gathers data from one or two instruments, prints data provided by each sampling, makes statistical computations of variables and frequency distribution, and stores "running totals" in registers. In the case of dual sources, co-variance and correlation coefficients are also calculated.

DATA ACQUISITION PROGRAM.

Gathers and stores data in R registers. At the user's option, the program prints data as each sample is taken, or as a comprehensive print-out during execution of statistical parameters program. Curve fitting program generates least squares curve fits for a line, exponential or power function.

31/10 Graphic Calculator System.

STANDARD PLOT PROGRAMS.

Includes standard data plots; function plots that enable plotting of any user-defined single variable function; and histogram plots, which allow generating and updating histograms.

OPTIONAL PLOT PROGRAM. As an expansion of the standard plot program, it is designed to run with Option 4 Memory (2048 steps). Accommodates one or two variable data, pie chart and frequency distribution plots, and allows such additional display features as pre-determined size and location of viewing window and axis labeling.

31/4661 Digital Plotter System.

DATA PLOT PROGRAM. Plots data within a user-defined plot area. User defined axes with tic marks are also available.

FUNCTION PLOT PROGRAM. Plots single variable functions. Allows auto-scaling, plus selection of window size and location, axis intersection, horizontal and vertical tic intervals.

HISTOGRAM PLOT PROGRAM. Provides user-selected plot size, data limits, cell width, and an edit feature.

4921/4922 Flexible Disc File Management (see back cover).

OVERLAY MONITOR PROGRAMS.

Provide interactive file management capabilities through user-defined overlay.

RUN-TIME ROUTINES. Perform data I/O, data file manipulation, and program file overlaying into memory under program control.

UTILITY PROGRAMS. Perform various housekeeping and miscellaneous functions. (over)



4661 Extended Graphics Program Library.

Contains programs designed for the 31 with memory options 1 and 9, plus the 4661 Digital Plotter. Included are two- and three-dimensional data plots; two- and three-dimensional function plots; polar data plots; and polar function plots.

Customized Software

Of course, the Tektronix software library is not the last word in programming. You can revise these programs to meet your special needs, build new programs from spare parts, or write your own from scratch. With a memory configuration range from 128 steps to a gargantuan 8192 steps on the 31's Option 10, plus linking capability and magnetic tape storage, your range is virtually unlimited.

If you find a need for custom software to fit your special application, just call your Tektronix representative.

He'll put you in touch with the experts who'll put you on top of your job.

4921/4922 File Management

Overlay Monitor Programs

Program Files	Create Save Load	Expand Run
Data Files	Create Save Load	Expand Change List
File Handling	Copy Rename Delete	Clear List Directory

Utility Programs

Housekeeping
System
Management

Run-Time Routines

Program Linking

File Handling Create or extend data.
Free space.
Directory file info

Sequential or random access of data files

Tektronix, Inc.
Information Display Division
P.O. Box 500
Beaverton, OR 97077
Telephone: (503) 644-0161 or 292-2611
Telex: 36-691
Cable: TEKTRONIX
or Tektronix Datatek N.V.
P.O. Box 159, Badhoevedorp
Telex: 16585
Cable: Datatek Holland

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